CLAIMS AMENDMENTS

Please amend the claims as described below. In accordance with 37 CFR §1.121, a complete listing of all claims in the application is provided below. The status of each claim is indicated in the parenthetical expression adjacent to the claim number.

1. (**Currently Amended**) A method of transmitting information symbols, at a symbol rate (R), using ~~In~~ a transmission system comprising a transmitter, ~~and~~ a receiver, and ~~a method of transmitting information symbols having a symbol rate (R) via~~ a channel having a bandwidth (B), the method comprising:

~~defining transmission quality and channel characteristics;~~

~~in the transmitter,~~ frequency spreading and time spreading the information symbols to provide an output signal; ~~and thereafter~~

transmitting ~~an information symbol~~ the output signal;

~~upon~~ receiving the transmitted ~~information symbol~~ output signal; ~~in the receiver, adaptively~~

frequency de-spreading and time de-spreading the ~~information symbols~~ output signal to provide the information symbols; ~~and~~

adaptively controlling ~~transmission system gain~~ the frequency spreading and time spreading of the information symbols in relation to ~~the~~ a transmission quality and channel characteristics; and

wherein the frequency spreading of each information symbol is provided (i) by a quasi Dirac pulse formation and subsequent filtering or (ii) by digital signal processing.

2. (**Currently Amended**) The method of ~~C~~claim 1, wherein a transmission system gain is controlled by varying symbol rate (R).

3. (**Currently Amended**) The method of ~~C~~claim 1, further comprising ~~the step~~ ~~of~~:

adjusting the frequency spread of the information symbols in relation to at least one parameter selected from a group of parameters consisting of transmitter power, bit error rate, and transmission speed.

4. (**Currently Amended**) The method of ~~C~~claim 3, further comprising ~~the step~~ ~~of~~:

adjusting the time spread of the information symbols in relation to at least one parameter selected from a group of parameters consisting of transmitter power, bit error rate, and transmission speed.

5. (**Currently Amended**) The method of claim 4, wherein frequency spreading of the information symbols comprises:

forming quasi Dirac pulses and filtering the quasi Dirac pulses, such that each information symbols is fully spread across channel bandwidth (B); and,

wherein time spreading of the information symbols comprises~~:~~ interleaving one or more information symbols ~~signals~~ with a correlation signal.

6. (**Previously Presented**) The method of claim 5, wherein the correlation signal is a chirp pulse signal.

7. (**Previously Presented**) The method of claim 4, wherein at least one of transmitter power, bit error rate, and transmission speed is individually matched to a transmission system subscriber.

8. (**Currently Amended**) The method of claim 5, further comprising:

assessing channel characteristics using the ~~transmitted information symbol~~ received output signal.

9. (**Previously Presented**) The method of claim 8, further comprising:

reducing symbol rate (R) in relation to a constant channel bandwidth as determined by a channel characteristic assessment.

10. (**Previously Presented**) The method of claim 9, wherein frequency spreading of the information symbols further comprises:

forming a quasi Dirac pulse sequence in a first transmitter stage for each information symbol, regardless of the symbol rate; and,

band pass filtering the quasi Dirac pulse sequence in a second transmitter stage.

11. (**Currently Amended**) The method of claim 5, further comprising:

~~compresssing~~ compressing the ~~information symbol~~ output signal in the receiver.

Claims 12-22 (**Canceled**).

23. (**Currently Amended**) The method of claim 4, wherein the time spreading of the information symbols includes ~~in the transmitter is accomplished~~ using a dispersive filter having a suitable frequency/run-time characteristic.

24. (**Currently Amended**) The method of claim 23, wherein the dispersive filter in the transmitter and a corresponding filter in the receiver used for time-compression are implemented in the form of acoustic surface wave filters (SAW filters).

25. (**Previously Presented**) The method of claim 23, wherein the dispersive filter in the transmitter and a corresponding filter in the receiver used for time-compression are implemented in the form of charge-coupled device filters (CCD filters).

26. (**Currently Amended**) The method of claim 8, wherein channel assessment is made in the receiver in relation to a channel pulse response arising from ~~the~~ transmission of a time-compressed reference symbols.

27. (**Currently Amended**) The method of claim 26, further comprising:

synchronizing a symbol clock in the receiver in accordance with the transmitted time-compressed reference symbols.

28. (**Currently Amended**) The method of claim 5, wherein the correlation signal comprises a signal having an autocorrelation characteristic fulfilling ~~the~~ a fFirst Nyquist criterion.

29. (**Previously Presented**) The method of claim 6, wherein the chirp pulse signal is weighted with an absolute frequency sequence of a root Nyquist filter.

30. (**Previously Presented**) The method of claim 5 wherein the correlation signal is one selected from a group of correlation signals having characteristics determined by conditions external to the transmission of the information symbols.

Claim 31 (**Canceled**).

32. (**Currently Amended**) The method of claim 26, further comprising:

using an iterative process, calculating the channel pulse response in parametric form using one or more reflection coefficients;

determining multipath echo from the channel pulse response; and

subtracting the multipath echo from the signal received at an equalization stage in the receiver.

33. (**NEW**) The method of claim 1 wherein each information symbol is frequency spread to: (i) a bandwidth that is larger than a bandwidth without frequency spreading or (ii) a full available channel bandwidth.

34. (**NEW**) The method of claim 33 wherein time spreading of the information symbol is provided by interleaving an information symbol with a correlation signal.

35. (**NEW**) The method of claim 1 wherein the frequency spreading and time spreading of the information symbols are matched adaptively to a required transmission quality and the channel characteristics.

36. (**NEW**) The method of claim 1 wherein time spreading of the information symbol is provided by interleaving an information symbol with a correlation signal.

37. (**NEW**) The method of claim 1 further including assessing the channel characteristics using the output signal.

38. (**NEW**) The method of claim 1 wherein the frequency spreading of the information symbols includes a first stage in which a quasi Dirac pulse formation takes place for each information symbol, and a second stage in which the quasi Dirac pulse sequence is band-pass filtered.

39. (**NEW**) A transmission system to perform the method of claim 1.

40. (**NEW**) A transmission system comprising:

a transmitter to transmit information symbols at a symbol rate (R), the transmitter including:

means for frequency spreading and time spreading the information symbols and for generating an output signal;

means for transmitting the output signal on a channel wherein the output signal is representative of the information symbols; and

a receiver to obtain the information symbols from the output signal, the receiver including means for frequency de-spreading and time de-spreading the output signal and for generating the information symbols using the output signal;

wherein the frequency spreading and the time spreading of the information symbols are adaptively controlled in the transmitter in relation to a transmission quality and the characteristics of the channel, and wherein the frequency spreading of each information symbol is provided (i) by a quasi Dirac pulse formation and subsequent filtering or (ii) by digital signal processing.

41. (**NEW**) The transmission system of claim 40, wherein the means for frequency spreading the information symbols includes a first means in which a quasi Dirac pulse formation takes place for each information symbol, and a second means in which the quasi Dirac pulse sequence is band-pass filtered.

42. (**NEW**) The transmission system of claim 40, wherein the means for time spreading includes means for time spreading of the information symbol by interleaving an information symbol with a correlation signal.

43. (**NEW**) The transmission system of claim 42, wherein correlation signal is a chirp pulse signal.

44. (**NEW**) The transmission system of claim 40, wherein the transmitter generates the output signal by adaptively matching characteristics of the output signal to a required transmission quality and the channel characteristics.

45. (**NEW**) A transmission system comprising:

a transmitter to adaptively transmit information symbols at a symbol rate (R), the transmitter including:

circuitry to adaptively frequency spread and time spread the information symbols;

circuitry to transmit the frequency spread and time spread information symbols on a channel; and

a receiver to obtain the information symbols from the transmitted frequency spread and time spread information symbols, the receiver including:

circuitry to receive the frequency spread and time spread information symbols on the channel;

circuitry to frequency de-spread and time de-spread the received frequency spread and time spread information symbols and for generating the information symbols therefrom;

wherein the frequency spreading and the time spreading of the information symbols is controlled in the transmitter in relation to a transmission quality and channel characteristics, and wherein the circuitry to adaptively frequency spread the information symbols comprises circuitry to perform the frequency spread (i) by a quasi Dirac pulse formation and subsequent filtering or (ii) by digital signal processing.

46. (**NEW**) A method of providing communication channels between a plurality of subscriber stations wherein each subscriber station includes a transmitter and receiver coupled to a channel, and wherein the plurality of subscriber stations transmit

at variable transmission energies and receive information symbols at variable data rates, the method comprising:

sequentially and adaptively transmitting information symbols in frequency spread and time spread mode over the channel;

receiving the transmitted frequency spread and time spread information signals; and

frequency de-spreading and time de-spreading the received frequency spread and time spread information signals to provide the information symbols, wherein the respective frequency spreading and the respective time spreading of the information symbols in a transmission to a respective subscriber is performed in relation to a transmission quality and channel characteristics for the respective subscriber.

47. (**NEW**) A method of transmitting information symbols using a transmission system comprising a transmitter, a receiver, and a channel having a bandwidth, the information symbols being transmitted in accordance with one or more transmission parameters selected from a group of parameters comprising transmission speed, bit error rate, and transmitter power, the method comprising:

determining a first priority transmission parameter;

assessing channel transmission characteristics at the receiver;

communicating the assessed channel transmission characteristics to the transmitter before beginning transmission of the information symbols; and,

transmitting the information symbols while maintaining a predetermined value for at least the first priority transmission parameter, wherein information symbols are transmitted in a sequence of time slots;

adjusting transmitter power on a time slot by time slot basis in relation to a determination of transmission system gain during each time slot;

defining within the transmission system an organization channel and a plurality of mutually independent message channels, each one of the plurality of mutually independent message channels defining a corresponding sequence of time slots;

defining transmission frames, each frame having a frame length and comprising a sub-frame interval during which channel characteristics, including transmission system gain, are measured;

transmitting information symbols via a selected one of the plurality of message channels in relation to a transmission frame;

varying the time slots in the selected one message channel in accordance with measured channel characteristics;

varying transmitter power on a time slot by time slot basis in accordance with transmission system gain; and

wherein individual transmission system subscriber time slots in a transmission frame are arranged in accordance with their assigned transmitter power.

48. (**NEW**) The method of claim 47, wherein transmitter power in any one time slot is distributed over a plurality of overlapping chirp pulses.

49. (**NEW**) The method of claim 47, wherein information symbol spacing in a time slot for channel measurement is set to be so large that adjacent chirp pulses do not overlap.

50. **(NEW)** The method of claim 49, further comprising:

for each transmission system subscriber, setting logic parameters for a given message channel, the logic parameters including at least length of time slots, symbol rate within individual time slots, and transmitter power provided during individual time slots, in accordance with measured channel characteristics and in relation to subscriber-specific requirements.